Supplementary Table S1 Number of single nucleotide polymorphisms (N SNPs), average distance (kb), Linkage Disequilibrium (r2) with standard deviation (s.d.) and corrected r2 (Hill and Robertson, 1968) between adjacent SNPs on each chromosome (OAR) in the Barbaresca sheep breed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| OAR | N SNPs | average distance (kb) | *r2*±s.d. | *Corrected r2* |
| 1 | 4656 | 64.34 | 0.240 ± 0.270 | 0.230 |
| 2 | 4418 | 59.57 | 0.240 ± 0.268 | 0.230 |
| 3 | 4001 | 60.02 | 0.229 ± 0.261 | 0.219 |
| 4 | 2209 | 57.59 | 0.222 ± 0.257 | 0.212 |
| 5 | 1901 | 61.03 | 0.214 ± 0.249 | 0.204 |
| 6 | 1998 | 62.13 | 0.242 ± 0.247 | 0.232 |
| 7 | 1815 | 59.36 | 0.214 ± 0.251 | 0.204 |
| 8 | 1695 | 57.72 | 0.214 ± 0.248 | 0.204 |
| 9 | 1738 | 58.02 | 0.212 ± 0.249 | 0.202 |
| 10 | 1409 | 61.16 | 0.259 ± 0.286 | 0.250 |
| 11 | 926 | 72.28 | 0.214 ± 0.251 | 0.204 |
| 12 | 1375 | 61.81 | 0.212 ± 0.248 | 0.202 |
| 13 | 1376 | 64.63 | 0.221 ± 0.253 | 0.211 |
| 14 | 897 | 75.33 | 0.217 ± 0.250 | 0.207 |
| 15 | 1297 | 67.92 | 0.234 ± 0.267 | 0.224 |
| 16 | 1276 | 60.42 | 0.190 ± 0.229 | 0.180 |
| 17 | 1150 | 68.27 | 0.213 ± 0.250 | 0.203 |
| 18 | 1134 | 63.41 | 0.217 ± 0.247 | 0.207 |
| 19 | 981 | 66.11 | 0.226 ± 0.260 | 0.216 |
| 20 | 883 | 61.17 | 0.206 ± 0.234 | 0.196 |
| 21 | 743 | 71.14 | 0.191 ± 0.238 | 0.181 |
| 22 | 882 | 59.95 | 0.192 ± 0.228 | 0.182 |
| 23 | 930 | 71.36 | 0.195 ± 0.232 | 0.185 |
| 24 | 593 | 74.72 | 0.189 ± 0.231 | 0.179 |
| 25 | 831 | 57.84 | 0.208 ± 0.247 | 0.198 |
| 26 | 743 | 64.95 | 0.192 ± 0.237 | 0.182 |
| Mean |  | 63.93 | 0.215 ± 0.018 |  |

Supplementary Table S2 Descriptive statistics of the number and the frequency distribution of runs of homozygosity (ROH) in different ROH length categories (Mb) in the Barbaresca sheep breed.

|  |
| --- |
| ROH length categories (Mb) |
| 1-5 | 5-10 | 10-15 | 15-20 | >20 |
| nROH | Freq | nROH | Freq | nROH | Freq | nROH | Freq | nROH | Freq |
| 219 | 0.34 | 212 | 0.33 | 85 | 0.13 | 39 | 0.06 | 82 | 0.13 |

n ROH = number of ROH; Freq = relative frequency of ROH on different ROH length categories

Supplementary Table S3 Genetic differentiation between population pairs measured using FST (below diagonal) and Reynolds genetic distances (above diagonal).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | VDB | COM | PIN | BAR | SAW | MER | CAS | CHI | LEC | LAC | SAB |
| VDB |  | 0.2457 | 0.2226 | 0.342 | 0.2884 | 0.2705 | 0.2718 | 0.3601 | 0.2621 | 0.2795 | 0.3288 |
| COM | 0.0501 |  | 0.1748 | 0.3095 | 0.2655 | 0.2434 | 0.2428 | 0.3355 | 0.2323 | 0.2556 | 0.3113 |
| PIN | 0.0405 | 0.0217 |  | **0.2902** | 0.2350 | 0.2129 | 0.2133 | 0.3178 | 0.1982 | 0.2249 | 0.2836 |
| BAR | 0.1038 | 0.0824 | **0.071** |  | 0.3512 | 0.3335 | 0.3343 | 0.4019 | 0.3254 | 0.3426 | 0.3882 |
| SAW | 0.0703 | 0.0573 | 0.043 | 0.1086 |  | 0.2685 | 0.2701 | 0.3651 | 0.2657 | 0.2795 | 0.2796 |
| MER | 0.0632 | 0.0492 | 0.0368 | 0.0976 | 0.0588 |  | 0.2307 | 0.3400 | 0.2417 | 0.2440 | 0.3132 |
| CAS | 0.0591 | 0.0437 | 0.0312 | 0.0957 | 0.0549 | 0.0378 |  | 0.3404 | 0.2439 | 0.2466 | 0.3149 |
| CHI | 0.1137 | 0.096 | 0.0846 | 0.1454 | 0.1154 | 0.0987 | 0.0962 |  | 0.3390 | 0.3499 | 0.3988 |
| LEC | 0.0537 | 0.0385 | 0.0251 | 0.0893 | 0.0522 | 0.043 | 0.0385 | 0.0947 |  | 0.2522 | 0.3107 |
| LAC | 0.0693 | 0.0567 | 0.0432 | 0.1047 | 0.0663 | 0.0511 | 0.0472 | 0.1068 | 0.05 |  | 0.3216 |
| SAB | 0.091 | 0.0794 | 0.0632 | 0.1339 | 0.0583 | 0.0802 | 0.0779 | 0.1394 | 0.0746 | 0.0871 |  |

(BAR, Barbaresca; CAS, Castellana; CHI, Chios; COM, Comisana; LAC, Lacaune; LEC, Leccese; MER, Merinos; PIN, Pinzirita; SAB, Sarda Black; SAW, Sarda White; VDB, Valle del Belice).

Supplementary Table S4 Pearson correlation of signed r values for the distance pairs < 10 kb (above diagonal) and between 150 and 250 kb (below diagonal).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | VDB | COM | PIN | BAR | SAW |
| VDB |  | 0.613 | 0.709 | 0.454 | 0.539 |
| COM | 0.265 |  | 0.535 | 0.429 | 0.402 |
| PIN | 0.369 | 0.136 |  | 0.501 | 0.467 |
| BAR | 0.070 | 0.038 | 0.132 |  | 0.392 |
| SAW | 0.158 | 0.040 | 0.050 | 0.031 |  |

(BAR, Barbaresca; COM, Comisana; PIN, Pinzirita; SAW, Sarda White; VDB, Valle del Belice).